

CLAIMS

What is claimed is:

1. A method comprising:
connecting the output of at least two driver circuits to a resistive network, wherein the output signals from the at least two driver circuits are combined through the resistive network to produce a resultant signal ; and
configuring the resistive network and the at least two driver circuits such that the resultant signal is provided to a first node of the resistive network but not to a second node of the resistive network.
2. The method as recited in Claim 1, wherein the resultant signal includes an attenuated version of at least one of the output signals.
3. The method as recited in Claim 1, further comprising:
coupling an input/output node of an external circuit to the first node of the resistive network, the external circuit being configured to receive the resultant signal and output an external signal; and
coupling an input node of a receiver circuit to the second node of the resistive network.
4. The method as recited in Claim 3, further comprising:
simultaneously providing the resultant signal to the external circuit and the external signal to the receiver circuit, bi-directionally through a connector coupling the resistive network to the external circuit.

5. The method as recited in Claim 4, wherein the external circuit includes a device under test (DUT).

6. The method as recited in Claim 5, wherein the device under test (DUT) includes an integrated circuit.

7. The method as recited in Claim 4, wherein the at least two driver circuits and the receiver circuit are part of an automated test equipment (ATE) device.

8. The method as recited in Claim 7, wherein the resistive network is part of the automated test equipment (ATE) device.

9. The method as recited in Claim 7, wherein the resistive network is included in a load board coupled to the external circuit and the automated test equipment (ATE) device.

10. An apparatus comprising:
a receiver circuit configured to receive an external signal;
a first driver circuit configured to output a first signal;
a second driver circuit configured to output a second signal; and
a resistive circuit coupling the receiver circuit, first driver circuit and second driver circuit together, the resistive circuit being configured to combine the first signal and the second signal to produce a resultant signal at a first node and a substantially attenuated signal at a second node to

which the receiver circuit is coupled, and wherein the attenuated signal has an amplitude within a negligible range with respect to operation of the receiver circuit.

11. The apparatus as recited in Claim 10, wherein the resistive circuit including a first resistive element, a second resistive element and a third resistive element, and wherein a first transmission path including the second resistive element is coupled to the output of the first driver circuit and a first node of the first resistive element, a second transmission path including the third resistive element is coupled to the output of the second driver circuit and a second node of the first resistive element, the second node of the first resistive element is further coupled to an input node of the receiver circuit, and the first node of the first resistive element is further configurable to receive the external signal.
12. The apparatus as recited in Claim 11, wherein one of the first and second signals has a positive voltage level, and wherein another of the first and second signals has a negative voltage level.
13. The apparatus as recited in Claim 11, wherein at least one of the first, second and third resistive elements is a resistor.
14. The apparatus as recited in Claim 11, wherein the first and second transmission paths further include first and second transmission lines, respectively, and the receiver circuit is coupled to the second node of the first resistive element through a third transmission line.

15. The apparatus as recited in Claim 14, wherein each of the first, second and third transmission lines present substantially the same impedance.

16. The apparatus as recited in Claim 14, further comprising a fourth transmission line having one end coupled to the first node of the first resistive element and an other end configurable to receive the external signal.

17. The apparatus as recited in Claim 16, wherein each of the first, second, third, and fourth transmission lines present substantially the same impedance.

18. The apparatus as recited in Claim 16, wherein the first resistive element is matched to the impedance as presented by the fourth transmission line.

19. The apparatus as recited in Claim 14, wherein the receiver circuit is impedance matched to the third transmission line, first driver circuit is impedance matched to the first transmission line, and second driver circuit is impedance matched to the second transmission line.

20. The apparatus as recited in Claim 10, wherein the resultant signal at the first node is provided to a device under test (DUT) that is coupled to the

first node, the DUT being configured to further provide the external signal to the receiver circuit.

21. The apparatus as recited in claim 20, wherein the external signal experiences a generally matched impedance path when provided to the receiver circuit from the DUT.

22. The apparatus as recited in Claim 10, wherein the receiver circuit, first driver circuit and second driver circuit are provided within an automated test equipment (ATE) device.

23. The apparatus as recited in Claim 10, wherein the resistive circuit is provided within a load board.

24. A system comprising:

- a device configured to simultaneously output an external signal and input a resultant signal;

- a receiver circuit configured to receive the external signal;

- a first driver circuit configured to output a first signal;

- a second driver circuit configured to output a second signal; and

- a resistive circuit coupling the receiver circuit, first driver circuit and second driver circuit together, the resistive circuit being configured to combine the first signal and the second signal to produce a resultant signal at a first node and a substantially attenuated signal at a second node to which the receiver circuit is coupled, and wherein the attenuated signal has

an amplitude within a negligible range with respect to operation of the receiver circuit.

25. A system comprising:

- a device under test (DUT) that is configured to simultaneously output an external signal and input a resultant signal;

- a test apparatus configured to test the ability to of the DUT to support simultaneous bi-directional communication, the test apparatus comprising:

- a receiver circuit configured to receive the external signal;

- a first driver circuit configured to output a first signal;

- a second driver circuit configured to output a second signal;

- and

- a resistive circuit coupled to the receiver circuit, the first driver circuit, the second driver circuit, and the DUT, the resistive circuit being configured to combine the first signal and the second signal to produce the resultant signal at a first node and a substantially attenuated signal at a second node to which the receiver circuit is coupled, and wherein the attenuated signal has an amplitude within a negligible range with respect to operation of the receiver circuit.

26. A load board apparatus for use in coupling a device under test (DUT) to an automated test equipment (ATE) device, the ATE device

having at least two driver circuits and at least one receiver circuit, the load board apparatus comprising:

a combining circuit configurable to support bi-directional signaling between the DUT and the ATE device, wherein the combining circuit is configured to receive a first signal from a first driver circuit and a second signal from a second driver circuit, produce a resultant signal based on the first and second signals, and apply the resultant signal to the DUT and a substantially attenuated signal to the receiver circuit, wherein the substantially attenuated signal has an amplitude within a negligible range with respect to operation of the at least one receiver circuit.

27. A load board apparatus for use in coupling a device under test (DUT) to an automated test equipment (ATE) device, the ATE device having a first driver circuit, a second driver circuit and a receiver circuit, the load board apparatus comprising:

an output configurable to connect to the receiver circuit of the ATE;

a first input configurable to connect to the first driver circuit of the ATE;

a second input configurable to connect to the second driver circuit of the ATE;

a connector configurable to connect to the DUT; and

a resistive circuit coupled to the output, the first input, the second input, and the connector, the resistive circuit configured to receive a first input signal from the first input and a second input signal from the second input, the resistive circuit to generate a resultant signal based on the first

input signal and the second input signal, and provide the resultant signal to the connector, and wherein in generating the resultant signal the resistive circuit causes only a substantially attenuated signal to be provided to the output configurable to connect to the receiver circuit of the ATE device, wherein the attenuated signal has an amplitude within a negligible range with respect to operation of the receiver circuit.